

## WHAT IS CLAIMED IS:

1. A method for producing a cobalt-protein complex comprising:

the step a) of preparing a solution including  $\text{Co}^{2+}$  ions, a protein, a pH buffer agent and a  $\text{Co}^{2+}$  associating agent; and

5 the step b) of adding an oxidizing agent to the solution and thereby making the protein contain particles composed of cobalt.

2. The method for producing a cobalt-protein complex of claim 1, wherein each of the pH buffer agent and the  $\text{Co}^{2+}$  associating agent is HEPES.

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3. The method for producing a cobalt-protein complex of claim 1, wherein the protein is apoferritin.

4. The method for producing a cobalt-protein complex of claim 1, wherein the  
15 oxidizing agent is  $\text{H}_2\text{O}_2$ .

5. A method for producing a cobalt-protein complex comprising:

the step a) of preparing a solution including  $\text{Co}^{2+}$  ions, apoferritin and HEPES;  
and

20 the step b) of adding  $\text{H}_2\text{O}_2$  to the solution and thereby making the apoferritin contain particles composed of cobalt.

6. The method for producing a cobalt-protein complex of claim 1, wherein the pH of the solution prepared in the step a) is not less than 7.5 and not more than 9.0.

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7. The method for producing a cobalt-protein complex of claim 6, wherein the pH is not less than 8.0 and not more than 8.8.

8. The method for producing a cobalt-protein complex of claim 1, wherein the step  
5 b) is performed at a temperature of 70 C° or less.

9. The method for producing a cobalt-protein complex of claim 1, wherein the step  
b) is performed at a temperature of not less than 40 C° and not more than 70 C°.

10 10. The method for producing a cobalt-protein complex of claim 9, wherein the  
step b) is performed at a temperature of not less than 50 C° and not more than 60 C°.

11. The method for producing a cobalt-protein complex of claim 1, wherein  
the protein is a thermophile apoferritin, and  
15 the step b) is performed at a temperature of not less than 80 C° and not more than  
100 C°.

12. The method for producing a cobalt-protein complex of claim 1, wherein the  
particles composed of cobalt includes CoO(OH).

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13. The method for producing a cobalt-protein complex of claim 5, wherein the pH  
of the solution prepared in the step a) is not less than 7.5 and not more than 9.0.

14. The method for producing a cobalt-protein complex of claim 13, wherein the  
25 pH is not less than 8.0 and not more than 8.8.

15. The method for producing a cobalt-protein complex of claim 5, wherein the step b) is performed at a temperature of 70 C° or less.

5        16. The method for producing a cobalt-protein complex of claim 5, wherein the step b) is performed at a temperature of not less than 40 C° and not more than 70 C°.

17. The method for producing a cobalt-protein complex of claim 16, wherein the step b) is performed at a temperature of not less than 50 C° and not more than 60 C°.

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18. The method for producing a cobalt-protein complex of claim 5, wherein the protein is a thermophile apoferritin, and the step b) is performed at a temperature of not less than 80 C° and not more than 100 C°.

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19. The method for producing a cobalt-protein complex of claim 5, wherein the particles containing cobalt are composed of CoO(OH).